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CASE DOCKET NO. JA999-716  
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Transmitted herewith for filing is the Patent Application of:

Inventors: Dermot Timothy O'Brien

For: DYNAMIC PARAMETER MODIFICATION

Enclosed are:

- ☒ 4 Sheets of Informal Drawings.
- ☒ An assignment of the invention to International Business Machines Corporation, Armonk, New York 10504.
- ☐ A certified copy of a \_\_\_\_\_ application.
- ☒ Declaration and Power of Attorney is attached to the application.
- ☐ Preliminary Amendment.
- ☐ Associate Power of Attorney.
- ☐ Information Disclosure Statement with form PTO-1449 with references attached.

The filing fee has been calculated as shown below:

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Patent Application

Four (4) Sheets of Informal Drawings

Declaration and Power of Attorney

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Docket No. JA999-716

## DYNAMIC PARAMETER MODIFICATION

### Field of the Invention

5 This invention relates to computing systems that are used for the provision of goods, services or information management. It relates particularly to the dynamic modification of parameters existing within such computing systems.

### Background of the Invention

10 In modern large computing systems a common topology has three tiers (physical and logical): (i) a presentation tier characterised by multiple workstations focusing on user interactions, (ii) a business tier characterised by multiple servers executing application/business logic, and (iii) a data tier characterised by multiple databases  
15 working on data storage and organization. A Local or Wide Area Network (LAN/WAN) interconnects the three tier elements.

Such computing systems find application in many and varied fields, ranging from university research and teaching facilities to business applications. In fact, almost  
20 every business will utilise such a system to transact its functions and serve its clients. For example, a system may be used to control inventory, for word processing and accounts purposes, and for servicing client's enquiries. Many businesses have very large client bases and may provide an extensive inventory of goods and services. One illustrative  
25 example is a telecommunications service provider (Telco) that serves a countrywide client base. The Telco's subscribers thus can number in the millions, and each customer will expect an immediate response from a Customer Service Representative (CSR) to any inquiry, which can range from billing information, a request for a new service, or the placing of orders for a product.

30 Similar examples are seen in Utilities, insurance companies, banks, hospitals, law firms, accountancy firms, stock exchanges, universities and Government agencies, to name but a few.

The data building blocks of the computing system - at a meta level - are termed  
35 'parameters'. These parameters are mapped to instances of customised objects upon

which the system executes the various applications that are supported. Telcos, for example, can have a very large number of parameters that are either externally configured by the customer or by a CSR. Such parameters can include tax rates, customer type, bank codes, and any other information specific to the individual customer's business. There is  
5 a need for new parameters to be added, and the structure of existing parameters to be modified, as quickly as possible.

In the prior art, system parameters are typically maintained via a discrete computer program. Every time a new parameter is introduced or the structure of an  
10 existing parameter changed, the computer program has to be rewritten in part to accommodate the modifications to the parameter set. Such rewriting requires the skills of a computer programmer and incurring cost and lost time.

It is therefore an object of the present invention to provide for ease of creation  
15 and modification of system parameters.

### Summary of the Invention

The invention provides a method for maintaining parameter data in a computing  
20 system, comprising the steps of:

- (a) creating a text file of parameter meta data;
- (b) representing said text file as a Graphical User Interface (GUI) having  
parameter fields, and for each parameter field, having one or more attribute sub-fields,  
each of said sub-fields being text editable; and
- 25 (c) storing attribute text entered in any said sub-field to a data store.

The invention further provides a method for maintaining parameter data in a computing system, comprising the steps of:

- (a) creating a text file of parameter meta data using XML;
- 30 (b) representing said text file as a Graphical User Interface (GUI) having  
parameter fields, and for each parameter field, having one or more attribute sub-fields,  
each of said sub-fields being text editable by use of Java code;
- (c) for a subset of said text file corresponding to a parameter, calling any  
existing data from said data store for said the relevant sub-fields; and

(d) storing attribute text entered or edited in the respective sub-field for the called parameter to said data store.

The invention yet further provides a client-server computing system comprising:

5 (a) one or more client processor machines, each having a visual display, and operating a Graphical User Interface (GUI);

(b) a server machine running an application program that utilises parameter meta data to represent data passed between said client machines and said server;

(c) a communications link between each said client and arranged such that  
10 each said client machine can communicate with said server; and

wherein said server includes a data store containing a text file of parameter meta data, and said GUI receives said text file and displays it on a said client machine as a plurality of parameter fields each said field having one or more attribute sub-fields, each said sub-field being text editable, and further wherein any attribute text entered in a said  
15 sub-field is stored in said server data store.

The invention yet further provides a method for maintaining parameter data in a computing system, comprising the steps of:

(a) creating a text file of parameter meta data;

20 (b) representing said text file as a Graphical User Interface (GUI) having parameter fields, each of said sub-fields being text editable; and

(c) storing attribute text entered in any said sub-field to a data store.

The invention yet further a computing device comprising:

25 (a) processor means running an application program that utilises parameter meta data;

(b) a visual display operating a Graphical User Interface (GUI) under the control of said processor means;

(c) data storage means, containing a text file of parameter meta data under  
30 the control of said processor means; and

wherein said GUI receives said text file from said data storage means and displays it as a plurality of parameter fields, each said field having one or more attribute sub-fields, each said sub-field being text editable, and further wherein any attribute text entered in a said sub-field is stored in said data storage means.

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Examples of parameters included tax rates, customer types, bank codes, and any other information specific to a user or customer.

## 5     **Brief Description of the Drawings**

Non-limiting embodiments of the invention will now be described with reference to the accompanying drawings, in which:

10         Fig. 1 is a representative topology of a three tier computing system upon which the invention may be practised;

           Fig. 2 shows a block diagram relating to the parameter maintenance process;

           Fig. 3 shows a block diagram similar to Fig. 2;

           Fig. 4 shows a flow diagram illustrating the parameter maintenance process; and

15         Fig. 5 shows a GUI representation of the parameter maintenance process.

## **Detailed Description of Embodiments and Best Mode**

           Fig. 1 is a representative topology of a three tier computing system 10  
20     embodying the invention. The presentation (or client/user) tier is represented by a number (1...n) of workstations 20, that can be appropriate computing terminals, for example personal computers. The business tier is represented by a number (1...p) of servers 30, that can be dedicated mini or mainframe computers. The data tier is represented by a number (1...m) of databases 40, which can include dynamically managed  
25     magnetic or optical storage media.

           The computing system 10 is of an 'open' design, providing communication links 60,62,64, via external networks 70,72,74 to like-devices 22,32,42 and remote telephone terminals 24, 26.

30

           The workstations 20, servers 30, and databases 40 are interconnected by a Local or Wide Area Network (LAN or WAN) 50. The LAN/WAN 50 carries information passing between each of the three basic elements described. It will be appreciated that the topology shown in Fig. 1 is representative only, and that any other convenient form of

network could be implemented such that the objective of information passing between the workstations 20, servers 30 and databases 40 is achieved.

Embodiments of the invention find industrial application in the fields noted in the foregoing Background section. For the purposes of a non-limiting illustration, consider the example of a Telco operating across many States of the United States. Such a Telco will typically support local, regional, interstate and international voice and data calls, as well as cellular mobile voice and data traffic. Customers of the Telco can choose from a wide range of goods and services including, for example, the installation of second phone/fax/Internet lines, call forwarding, and messaging. They also will expect to be able to make enquiries of CSRs stationed at the workstations 20 concerning billing and service faults. It is not unreasonable to expect a modern-day Telco to have at least 1 million customers, typically requiring at least 500 CSRs. A Telco system infrastructure of this size can expect to handle about 15,000 business transactions per hour. For each business transaction there may be 6 CSR machine transactions required, and each individual machine transaction can involve up to 20 database transactions (i.e. I/Os).

To give a better example of the size of computing hardware required to achieve such performance, it is considered that the CSR workstations 20 should be Pentium™ personal computers running the Windows NT™ operating system, the servers 30 can be one or more IBM UNIX™-based 12-way RS6000™ S-70 machines, and the databases would require a capacity of about 40 Gbytes, managed by an Oracle™ or IBM DB-2™ system. There would, of course, be other operational LAN/WAN servers required to handle data communications, as would be readily understood by a person skilled in the art.

In business systems such as Telcos, customers call CSRs and request goods or services in everyday language, such as a request for 'call waiting' to be activated on a domestic telephone line. Indeed, the CSR also operates at this level and is presented with information (as a GUI) on the display of the workstation relating to such goods and services. The computing system 10 then acts on customers ordered goods or services or enquiries.

It is usual also to introduce the ideas of 'Definition Time', 'Maintenance Time' and 'Order Management Time'. Definition Time relates to the definition of a new

product to the point where it is available for association with a customer. Maintenance Time is where an existing Product is modified in terms of its Constituent Actions, Features and Tasks. Order Management Time is when the set of Products are alive and available to the CSRs at the workstations.

5

Before a specific embodiment is described, it is important to appreciate that the invention has broad application to computing systems that utilise instances of objects as data blocks, that are only statiated at run-time before being passed to between workstation, server or database.

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The data exists at all other times at a meta-level as generic parameters having sets or fields of attributes. For the present invention, the parameters exist as Extensible Markup Language (XML) text.

15 Telco Example

The 'goods and services' supported by the system 10 are termed "Products". Products exist within both the workstations 20 and the servers 30 of the computing system 10. Products are defined during Definition Time to be available for a CSR to populate an instance in response to a customer order. The Products are essentially a 'business world' construct.

Products can be defined to suit a particular business or customer need. In that sense, an existing Product can be amended in some way, or a new Product can be added to a 'Product Book', which is a logical grouping of Products, such as those that can be sold to residential customers. In the Telco environment, Products might include:

Standard Wireline Access: The wireline connection into a home, allowing the home to have the physical product of a telephone. It is the line into the house terminating in the adaptor that sits on the wall that telephones plug into.

Call Waiting: The ability to notify a customer that they have another call coming in to their phone line when they are on the phone.

Call Diversion: The ability to re-route telephone calls to another phone/mail box/pager, etc.

35



In the 'system world', it is the 'parameters' that represent the data building blocks that are acted upon by the computing application. Parameters are constituted by 'attributes'.

Parameters can be modified in any one of the Definition Time, Maintenance Time and Order Management Time.

### Parameter Maintenance

Fig. 2 shows a block diagram of the parameter maintenance application. The application Graphical User Interface (GUI) 150 (residing on a workstation 20) has two principal sub-fields: a navigator panel 152 and an edit panel 154. An XML textual file 160 is written to the application GUI 150 by Java™ code. The Java code resides on a server 30 in the sense of Fig. 1. Additionally, data is retrieved or stored from the database 170 to/from the GUI 150 in a manner that will presently be described. In the sense of Fig. 1, the database 170 would be one of the databases 40 on the WAN/LAN 50.

Fig. 3 is a block diagram similar to Fig. 2. The XML file 160 contains meta data of parameters arranged as groups. The navigator panel 152 shows, for the XML file, a corresponding tree structure having groups of parameters. Within each group is a set of parameters 184, noted as P1 and P2. When a particular parameter (P1) is selected for maintenance, it was then caused to appear in the edit panel 154 where its (textual) attributes can be populated or modified. The rows in the edit panel 54 thus represent individual parameters, while the columns represent the attributes of each parameter.

The maintenance process will now be described further with reference to Fig. 4, which is a flow diagram.

In step 200 the maintenance application commences. The XML file with the parameter meta data of step 202 is read in step 204. The XML meta data is parsed into an internal tree representation in step 206. The tree representation is constructed and displayed as the GUI panels 152, 154 in step 208. The user then selects a node on the GUI tree that appears in the navigator panel 152 in step 210. In step 212, a retrieve operation is performed from the parameter database 214. The retrieved parameter records are displayed in step 216 in tabular form in the edit panel 154. Now the user is able to

modify the record data, in step 218 for the displayed parameter (P1) which is then stored to the parameter database 214. In step 220 it is determined whether the maintenance procedure is finished and, if so, the maintenance application terminates in step 220, else a further node is selected in the navigator panel 152 in step 210.

An example of an XML file, omitting some repetitive 'attribute name' detail, is as follows:

```

5
10      <?xml version="1.0"? >
      <!DOCTYPE collection SYSTEM "parameters.dtd">
      <collection name="Collection" >
      <common name="Common" >
      <datastore name="Store" uri="serialized-parameter-file:///C:/temp\"/>
      <attribute-set name="Prefixed" >
15      <attribute name="Activation" id="Activation" type="Data"/>
      <attribute name="SortOrder" type="String"/>
      </attribute-set>
      <attribute-set name="Postfixed">
      <attribute name="Deactivation" id="Deactivation" type="Data"/>
20      </attribute-set>
      <attribute-set name="Audit">
      </attribute-set>
      <common>
      <group name="Billing">
25      <group>
      <group name="Customer">
      <parameter id="TCUSTYPE" name="Customer Type" store-name="TCUSTYPE" >
      <attribute is Key="yes" name="Type" type="String" id="TYPE" store-name="CTYPE" >
      <attributename="Description" type="String" id="DESCRIPTION" store-name="(DESCRIPTION"/>
30      <attribute name="Discount" type="Integer" id="DISCOUNT" store-name="(DISCOUNT"/>
      <parameter>
      <parameter id="TACCDEF" name="Account Default" store-name="TACCDEF" >
      <attribute name="Customer type" type="String" id="CUSTTYPE"
      store-name="CUSTTYPE"/>
35      <attribute name="Customer subtype" type="String" id="CUSTSUBTYPE"
      store-name="CUSTTYPE"/>
      <attribute name="Detailed bill option" type="String" id="DETAILEDBILLOPTION"
      store-name="CUSTSUBTYPE"/>
      <attribute name="Current charges summary" type="String" id="CURRENT CHARGEISSUMM"
40      store-name="CURRENT CHARGEISSUMM"/>
      <attribute name="Print S&E by line" type="String" id="PRINTSUMMBYLINE"
      store-name="PRINTSUMMBYLINE"/>
      <attribute name="Refund required" type="String" id="REFUNDREQUIRED"
      store-name="REFUNDREQUIRED"/>
45
      *
      *
      *

50      <attribute name="UpdateIdentifier" type="String" id="UPDATEID"
      store-name="UPDATEID"/>
      </parameter>
      <parameter id="TADDRPART" name="Address Part" store-name="TADDRPART">
      <attribute name="Address part type code" type="String" id="ADDRPARTTYPECODE"
55      store-name="ADDRPARTTYPECODE"/>

```

```
<attribute name="Address part type Description" type="String" id="ADDRPARTYPEDESC">  
  store-name=" ADDRPARTYPEDESC"/>  
  <attribute name="Update ID" type="String" id="UPDATEID"  
    store-name="UPDATEID"/>  
</parameter>
```

Fig. 5 is a more detailed GUI representation showing the navigator panel 152 and the edit panel 154 for the XML file noted above. The edit panel is made up of two sub-fields: the upper panel 156 representing a line summary of the attributes pertaining to each parameter, and the lower field 158 providing for input fields for a user. In the example shown, the parameter is Account default and a portion of the parameters are shown in the navigator panel 152. Specifically, the attributes are: customer type, customer sub-type, detailed bill option, current charges summary, and refund required. All of these attributes can be noted in the preceding listing.

Parameter data is stored in a table, which may be a table within a traditional database or may be in a binary file stored in the file system (i.e. databases 40).

The structure of the parameter is represented in XML. Each parameter is identified by elements surrounded by "parameter" tags. A "tag" is a word that has meaning as a delimiter in XML. Within the attribute definition, the parameter key (or code) attribute is identified by the signature "isKey=yes" appearing in the attribute definition.

The storage table may be a table stored in a database or may be in a binary file stored in the file system. Either way, a parameter has a number of parameter instances each represented a row in a table data structure and each uniquely identified by a key attribute. The columns in the table correspond to individual parameter attributes.

An example would be a "Customer Type" parameter which may have an attribute named "Type" representing the parameter code and a number of other attributes including a "Description" attribute. Each record in the parameter storage table will have a different value for the code attribute. The following is a schematic representation of the storage table for a simple "Customer Type" parameter:

Type	Description	Discount
"RES"	"Residential"	5

“BUS” “Business”

10

Any attribute of a parameter can be modified as a screen-based edit function. Such a modification is then stored in a data store by the use of a URI included in the XML file. The URI is structured so as to specify the database protocol before the first colon, and thereafter protocol specific location parameters are specified. In the present example, the application can determine that the datastore is a serialized file located within the file system within directory “C:\temp”. An individual parameter table can be located by appending the parameter identifier to the datastore URI.

The intention can be utilised to edit/amend an existing attribute or the populate vacant attribute sub-fields. In a similar way, the invention can add or modify parameters by simple amendment of the relevant XML file.

#### Another Embodiment

The invention also can be utilized on a stand-alone computing device, such as a Personal Computer (PC). The PC may be running a database application program within which there are multiple parameters that are required to be modifiable. The invention functions in an identical manner to that described above, except that the database storage device (e.g. the database 170 shown in Fig. 2) resides locally with the stand-alone PC.

#### Advantages of the Invention

The invention has advantages over the prior art by eliminating the need to create or modify application code with the introduction or modification of parameter types. Instead, an XML file can be edited and reloaded while the relevant system application is still running, and the maintenance GUI dynamically re-generated to accommodate modifications and allow new parameter values to be entered.

Dynamic calls are made by the maintenance application to create the required database tables or binary files, instead of requiring a skilled resource (e.g. computer programmer or system operator) to do this manually.

The UI is dynamically generated and new values can be entered against the new or modified parameters without requiring a restart of the maintenance application and without the need for a skilled developer to build and test the UI.

- 5 It is to be understood that the invention is not limited only to the embodiments described, but that numerous alterations and modifications, will be apparent to one skilled in the art, are included within its scope.

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**I claim:**

1. A method for maintaining parameter data in a computing system, comprising the steps of:

- 5 (a) creating a text file of parameter meta data;
- (b) representing said text file as a Graphical User Interface (GUI) having parameter fields, and for each parameter field, having one or more attribute sub-fields, each of said sub-fields being text editable; and
- (c) storing attribute text entered in any said sub-field to a data store.

10

2. The method of claim 1, whereby, in step (a), creation of said text file is performed using the Extensible Markup Language (XML).

15 3. The method of claim 2, whereby said XML text file includes as URI that specifies a database protocol and location, and said URI is utilized in step (c).

4. The method of claim 2, comprising the further step, following step (b), of:

calling any existing attribute data from said data store for said sub-fields to be displayed by said GUI.

20

5. The method of claim 4, whereby step (b) is performed by use of Java code.

25 6. The method of claim 1, comprising the further step, after step (b) said GUI, calling a subset of said text file, corresponding to a parameter to be displayed.

7. A method for maintaining parameter data in a computing system, comprising the steps of:

- 30 (a) creating a text file of parameter meta data using XML;
- (b) representing said text file as a Graphical User Interface (GUI) having parameter fields, and for each parameter field, having one or more attribute sub-fields, each of said sub-fields being text editable by use of Java code;
- (c) for a subset of said text file corresponding to a parameter, calling any existing data from said data store for said the relevant sub-fields; and
- 35

(d) storing attribute text entered or edited in the respective sub-field for the called parameter to said data store.

8. A client-server computing system comprising:

5 (a) one or more client processor machines, each having a visual display, and operating a Graphical User Interface (GUI);

(b) a server machine running an application program that utilises parameter meta data to represent data passed between said client machines and said server;

10 (c) a communications link between each said client and arranged such that each said client machine can communicate with said server; and

wherein said server includes a data store containing a text file of parameter meta data, and said GUI receives said text file and displays it on a said client machine as a plurality of parameter fields each said field having one or more attribute sub-fields, each said sub-field being text editable, and further wherein any attribute text entered in a said sub-field is stored in said server data store.

9. The system of claim 8, wherein said GUI also displays any existing attribute data retrieved from said data store.

20 10. The system of claim 9, wherein said text file is created using XML.

11. The system of claim 10, wherein said GUI utilises Java code to display said XML file.

25 12. A method for maintaining parameter data in a computing system, comprising the steps of:

(a) creating a text file of parameter meta data;

(b) representing said text file as a Graphical User Interface (GUI) having parameter fields, each of said sub-fields being text editable; and

30 (c) storing attribute text entered in any said sub-field to a data store.

13. The method of claim 12, whereby, in step (a), creation of said text file is performed using the Extensible Markup Language (XML).

14. The method of claim 13, whereby said XML text file includes as URI that specifies a database protocol and location, and said URI is utilized in step (c).

15. The method of claim 13, comprising the further step, following step (b),  
5 of:  
calling any existing attribute data from said data store for said fields to be displayed by said GUI.

16. The method of claim 15, whereby step (b) is performed by use of Java  
10 code.

17. The method of claim 12, comprising the further step, after step (b) said GUI, calling a subset of said text file, corresponding to a parameter to be displayed.

18. A computing device comprising:  
15 (a) processor means running an application program that utilises parameter meta data;  
(b) a visual display operating a Graphical User Interface (GUI) under the control of said processor means;  
20 (c) data storage means, containing a text file of parameter meta data under the control of said processor means; and

wherein said GUI receives said text file from said data storage means and displays it as a plurality of parameter fields, each said field having one or more attribute sub-fields, each said sub-field being text editable, and further wherein any attribute text  
25 entered in a said sub-field is stored in said data storage means.

19. The computing device of claim 18, wherein said GUI also displays any existing attribute data retrieved from said data store.

20. The computing device of claim 19, wherein said text file is created  
30 using XML.

21. The computing device of claim 20, wherein said GUI utilises Java code to display said XML file.



# ABSTRACT

## DYNAMIC PARAMETER MODIFICATION

Methods and apparatus for the dynamic modification of parameters existing  
5 within computing systems are described. An application program runs a Graphical User  
Interface (GUI) having a navigator panel 152 and an edit panel 154. An XML textual file  
160 is written to the application GUI 150 by Java™ code. The navigator panel 152  
represents the XML file in a tree structure having groups of parameters. When a  
particular parameter is selected, it is caused to appear in the edit panel 154, where its  
10 attributes (textual) can be added or modified. The modified parameter is then persisted to  
a database 170.

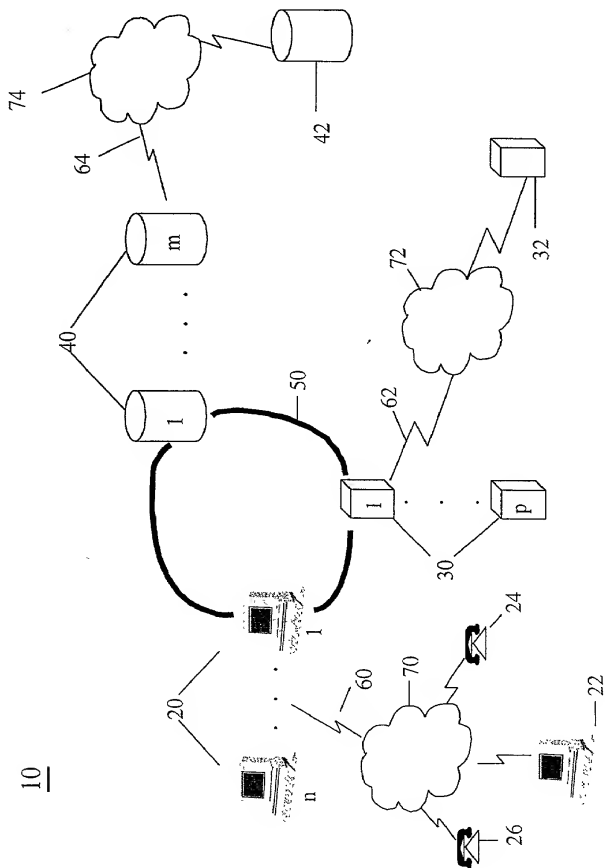


Fig. 1

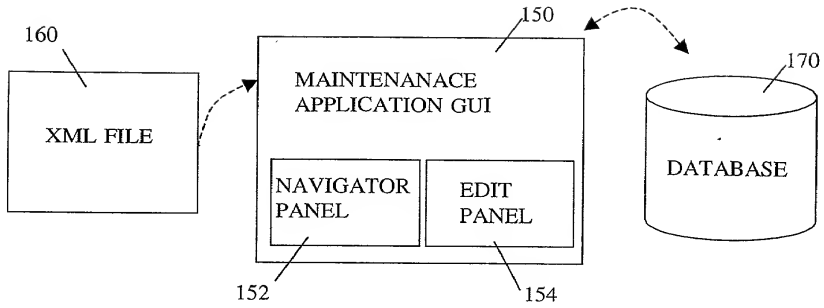


FIG. 2

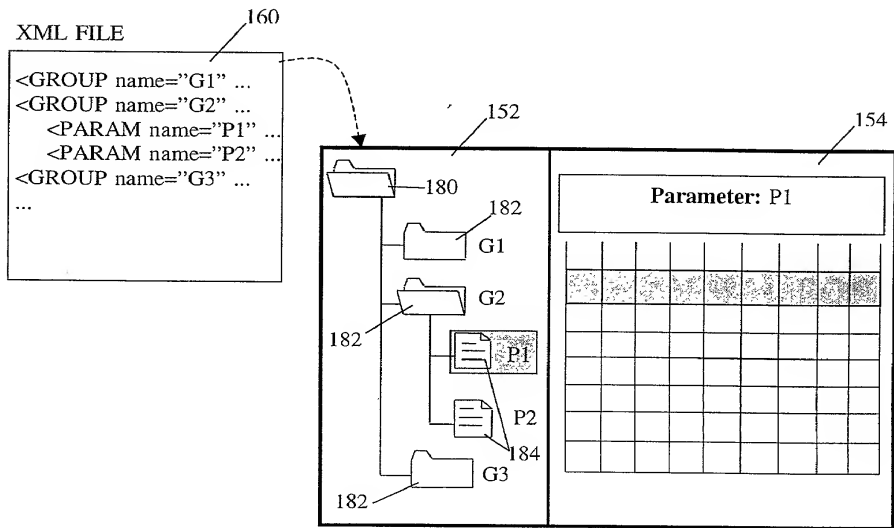
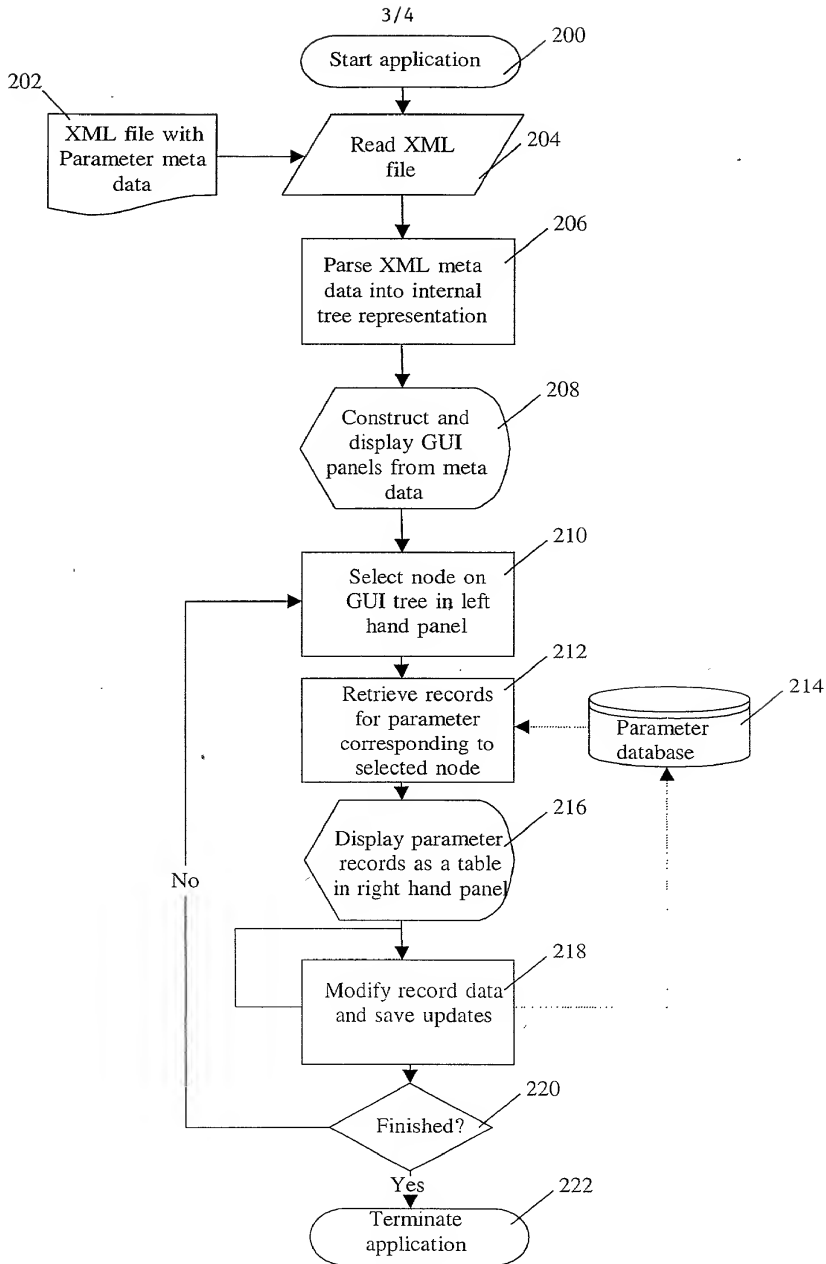


FIG. 3



**Fig. 4**

Subtree 0000000000

File Edit Parameter Help

Position to:  Go

Collection  
Billing  
Customer  
Account Default  
Address Part  
Address Type  
Address Usage  
Address format  
Address usage type  
Alert Code Master  
Bank Branch Data  
Bank Branch Rang  
Bank Details  
Communication T  
Contact Activities  
Contact Type Mast  
Credit Card numb  
Credit card compa  
Customer Classifi  
Customer Suftype  
Customer Title Ma  
Customer Type Ma  
Customer Type SL  
Discount Code Ma  
Home Status  
ID Type  
International trans

Position to:  Go

Account Default

Customer type Customer subtype Detailed bill option Current charges summary Refund requir

Effective 28/04/1998 00:00 Expiry Sort Order

New Edit ReActivate Remove

Show History

Welcome to BPMA for ActiveOrder

Fig. 5

Docket No. JA9-99-716

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

DYNAMIC PARAMETER MODIFICATION

the specification of which (check one)

X is attached hereto.

\_\_\_\_\_ was filed on \_\_\_\_\_ as

Application Serial No. \_\_\_\_\_

and was amended on \_\_\_\_\_  
(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)	Priority Claimed
(Number) _____ (Country) _____ (Day/Month/Year Filed) _____	Yes _____ No _____
(Number) _____ (Country) _____ (Day/Month/Year Filed) _____	Yes _____ No _____
(Number) _____ (Country) _____ (Day/Month/Year Filed) _____	Yes _____ No _____

I hereby claim the benefit under 35 U.S.C. §119(e) of any United States provisional application(s) listed below.

(Application Number) _____	(Filing Date) _____
(Application Number) _____	(Filing Date) _____

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States Application(s) listed below and, insofar as the subject matter of each of the claims of the application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Section 112, I acknowledge the duty to disclose information material to the patentability of this application as defined in Title 37, Code of Federal Regulations, Section 1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application;

(Application Serial No.) _____	(Filing Date) _____	(Status) (patented, pending, abandoned) _____
(Application Serial No.) _____	(Filing Date) _____	(Status) (patented, pending, abandoned) _____

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that willful false statements may jeopardize the validity of the application or any patent issued thereon.

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